

WHAT IS CLAIMED IS:

1. An optical disk of recording type on which data is recordable, including:

5 a data recording and reproducing area for recording data therein and reproducing data therefrom; and

a read-only disk identification information area for recording disk identification information for identifying said optical disk therein.

10 2. The optical disk as claimed in claim 1, wherein said disk identification information is formed by removing a reflection film formed on the optical disk in a strip shape.

15 3. The optical disk as claimed in claim 1, wherein said disk identification information includes an inherent disk identifier for each optical disk.

20 4. The optical disk as claimed in claim 1, wherein said data recording and reproducing area includes an area for recording therein encrypted data, which is encrypted using information including said disk identification information for identifying said optical disk as a key.

5. The optical disk as claimed in claim 4, wherein said encrypted data includes content data which is at least one of image data and music data.

25 6. The optical disk as claimed in claim 4,

wherein said encrypted data includes a descramble key for decrypting a cipher which has been performed on content data.

7. The optical disk as claimed in claim 4,
5 wherein said encrypted data includes:

(a) a descramble key for decrypting a cipher which has been performed on content data, and

(b) an error detection code for detecting an error in the descramble key.

10 8. An optical disk of recording type on which data is recordable,

wherein said optical disk includes a data recording and reproducing area for recording data therein and reproducing data therefrom, and

15 wherein said data recording and reproducing area includes an area for recording therein, content data which is at least one of encrypted image data and encrypted music data, and a descramble key for decrypting a cipher which has been performed on the content data.

20 9. The optical disk as claimed in claim 8, wherein said content data and said descramble key are recorded in the same sector.

10. The optical disk as claimed in claim 8,
25 wherein said content data and said descramble key are respectively recorded in sectors different from each other.

5 12. An optical disk of recording type on which data
is recordable, including:

10 a data recording and reproducing area for recording
therein and reproducing therefrom, content data including at
least one of encrypted image data and encrypted music data; and

13. An optical disk recording and reproducing apparatus for controlling at least one of:

(b) a reproducing operation for reproducing data from the data recording and reproducing area,

wherein said optical disk includes a disk
25 identification information area for recording therein disk

identification information for identifying said optical disk,
and

wherein said optical disk recording and reproducing
apparatus comprises;

5 reproducing means for reproducing said disk
identification information from said disk identification
information area; and

control means for judging whether or not at least
one of the recording operation and the reproducing operation
10 is performed based on the reproduced disk identification
information, and for controlling said optical disk recording
and reproducing apparatus to perform at least one of the
recording operation and the reproducing operation in response
to a judgment result.

15 14. An optical disk recording apparatus for
recording content data on an optical disk of recording type on
which data is recordable,

wherein said optical disk includes an area for
recording a disk identification information area for
20 identifying said optical disk, and

wherein said optical disk recording apparatus
comprises:

reproducing means for reproducing the disk
identification information from the disk identification
25 information area, and

recording means for recording at least partially encrypted data on the optical disk, using the reproduced disk identification information as a key.

15 15. The optical disk recording apparatus as claimed
in claim 14,

wherein said encrypted data includes a descramble key for decrypting a cipher which has been performed on the content data.

10 16. The optical disk recording apparatus as claimed
in claim 14,

wherein said encrypted data includes a descramble key for decrypting a cipher which has been performed on the content data, and an error detection code for detecting an error in the descramble key.

15 17. An optical disk reproducing apparatus for
reproducing content data from an optical disk of recording type
on which data is recordable,

wherein said optical disk includes a disk
identification information area for recording therein disk
20 identification information for identifying said optical disk,
and

wherein said optical disk reproducing apparatus
comprises:

reproducing means for reproducing said disk
25 identification information from said disk identification

information area, and

decrypting means for decrypting at least partially encrypted data using the reproduced disk identification information as a key after reproducing said at least partially encrypted data from said optical disk.

18. The optical disk reproducing apparatus as claimed in claim 17,

wherein the data to be decrypted includes a descramble key for decrypting a cipher which has been performed on the content data.

19. The optical disk reproducing apparatus as claimed in claim 17,

wherein the data to be decrypted includes a descramble key for decrypting a cipher which has been performed on the content data, and an error detection code for detecting an error in the descramble key, and

wherein said decrypting means detects an error included in said descramble key based on said error detection code.

20. An optical disk recording apparatus for recording content data on an optical disk of recording type on which data is recordable, comprising:

recording means for recording on said optical disk, encrypted content data and a descramble key for decrypting a cipher which has been performed on the content data.

21. The optical disk recording apparatus as claimed in claim 20,

wherein said recording means records the encrypted content data in a predetermined first sector, and records the descramble key in a second sector different from the first sector.

22. The optical disk recording apparatus as claimed in claim 21,

wherein said recording means records a pointer for pointing an area of the second sector in which the descramble key is recorded, in the first sector in which the encrypted content data is recorded.

23. An optical disk reproducing apparatus for reproducing content data from an optical disk of recording type on which data is recordable, comprising:

reproducing means for reproducing encrypted content data and a descramble key for decrypting a cipher which has been performed on the content data, from the optical disk.

24. The optical disk as claimed in claim 23, wherein said reproducing means reproduces the encrypted content data from a first sector of the optical disk, and reproduces the descramble key from a second sector of the optical disk different from the first sector.

25. The optical disk as claimed in claim 24, wherein said reproducing means reproduces a pointer

26. An optical disk recording apparatus for allocating and recording information about a descramble key required for encrypting data content, into a key management information area of an optical disk of recording type on which data is recordable, comprising:

allocating means for reproducing the information about the descramble key which is recorded in the key management information area, and for allocating an area for recording a descramble key to be recorded, within the key management information area, based on the reproduced descramble key and the acquired information about the descramble key.

acquiring means for acquiring a descramble key
required for reproducing content data; and

recording means for reproducing information about
25 the descramble key which is recorded in the key management

5 28. An optical disk recording apparatus for
recording content data on an optical disk of recording type on
which data is recordable,

wherein said optical disk recording apparatus
comprises:

judging means for judging whether or not content data can be recorded on the optical disk based on the reproduced disk identification information;

25 recording means for recording a key index for

29. An optical disk reproducing apparatus for reproducing a descramble key from a key management information area of an optical disk of recording type on which data is recordable,

first reproducing means for reproducing data from
said key management information area;

second reproducing means for reproducing a key index which is recorded in the same sector area as the sector area in which the data in the sector area is recorded when judging that the data in the sector area is scrambled, and reproducing a descramble key from a descramble key area indicated by the reproduced key index;

third reproducing means for reproducing the disk
25 identification information from the disk identification

decrypting means for reproducing the descramble key by decrypting the reproduced and encrypted descramble key using the reproduced disk identification information as a key.

wherein said decrypting means judges whether or not there is an error in the decrypted descramble key, based on the error detection code which is given to the decrypted descramble key, and judges whether or not the decrypted descramble key should be reproduced based on a judgement result.

15 (a) a recording operation for recording data into
a data recording and reproducing area of an optical disk of
recording type on which data is recordable, and

20 wherein said optical disk includes a disk
identification information area for recording therein disk
identification information for identifying said optical disk,
and

wherein said method includes the steps of:

25 reproducing the disk identification information

from the disk identification information area; and

judging whether or not at least one of the recording operation and the reproducing operation is performed based on the reproduced disk identification information, and

5 controlling the recording operation and the reproducing operation to perform at least one of the recording operation and the reproducing operation based on a judgement result.

32. An optical disk recording method for recording content data on an optical disk of recording type on which data
10 is recordable,

wherein said optical disk includes a disk identification information area for recording therein disk identification information for identifying said optical disk, and

15 wherein said method includes the steps of:
reproducing disk identification information from the disk identification information area; and

recording at least partially encrypted data on the optical disk, using the reproduced disk identification
20 information as a key.

33. An optical disk reproducing method for reproducing content data from an optical disk of recording type on which data is recordable,

wherein said optical disk includes a disk
25 identification information area for recording therein disk

identification information for identifying said optical disk,
and

wherein said method includes of the steps of:

reproducing the disk identification information
5 from the disk identification information area; and

decrypting at least partially encrypted data using
the reproduced disk identification information as a key, after
reproducing said at least partially encrypted data.

34. An optical disk recording method for recording
10 content data on an optical disk of recording type on which data
is recordable, including the steps of:

recording encrypted content data and a descramble
key for decrypting a cipher which has been performed on the
content data, on said optical disk.

35. An optical disk reproducing method for
15 reproducing content data from an optical disk of recording type
on which data is recordable, including the steps of:

reproducing encrypted content data and a descramble
key for decrypting a cipher which has been performed on the
20 content data, from said optical disk.

36. An optical disk recording method for allocating
and recording information about a descramble key required for
encrypting content data into a key management information area
of an optical disk of recording type on which data is recordable,
25 including the steps of:

reproducing information about the descramble key which is recorded in the key management information area, and allocating an area for recording therein the descramble key to be recorded, within the key management information area, based on the reproduced information about the descramble key and the acquired information about the descramble key.

acquiring a descramble key required for reproducing
15 content data; and

38. An optical disk recording method for recording content data on an optical disk of recording type on which data is recordable,

25 wherein said optical disk includes a disk

identification information area for recording therein disk
identification information for identifying said optical disk,
and

wherein said method includes the steps of:

5 reproducing the disk identification information
from the disk identification information area;

judging whether or not content data can be recorded
on the optical disk based on the reproduced disk identification
information;

10 allocating an area for recording a descramble key
required for encrypting the content data, into the key
management information area within the optical disk, when
judging that the content data can be recorded on the optical
disk; and

15 recording a key index for indicating an area for
recording the descramble key of content data to be recorded is
recorded in the same sector in which the content data to be
recorded is recorded.

39. An optical disk reproducing method for
20 reproducing a descramble key from a key management information
area of an optical disk of recording type on which data is
recordable,

wherein the optical disk includes a disk
identification information area for recording disk
25 identification information for identifying the optical disk,

and

wherein said method includes the steps of:

reproducing data from the key management information area;

5 based on data in a sector area within the reproduced key management information area, judging whether or not the data in the sector area is scrambled;

 reproducing a key index which is recorded in the same sector area as the sector area in which the data in the sector
10 area is recorded, when judging that the data in the sector area is scrambled, and reproducing a descramble key from a descramble key area indicated by the reproduced key index;

 reproducing the disk identification information from the disk identification information area; and

15 reproducing the descramble key by decrypting the reproduced and encrypted descramble key using the reproduced disk identification information as a key.

40. An optical disk of recording type on which data is recordable, including:

20 a first information area for recording first disk information therein;

 a second information area for recording therein second disk information for identifying each optical disk; and

 a user data area for recording information data by
25 irradiating a light beam onto said user data area.

41. The optical disk as claimed in claim 40,
wherein the second disk information is recorded by
partially removing a recording film within the second
information area, in an elongated shape in a radial direction
5 and at a plurality of areas.

42. The optical disk as claimed in claim 40,
wherein the second information area is arranged
within the first information area.

43. The optical disk as claimed in claim 40,
10 wherein the second information area is arranged on
an inner peripheral side of the first information area.

44. The optical disk as claimed in claim 40,
wherein the second information area is arranged over
a partial area within the first information area, and over
15 another area located on the inner peripheral side of the first
information area.

45. The optical disk as claimed in claim 40,
wherein the first disk information is recorded in
a form of minute concavo-convex pits.

20 46. An optical disk of recording type on which data
is recordable,

wherein said optical disk has a sector structure
comprising a plurality of sectors,

wherein each of the sectors includes a sector header
25 area and a main data area for recording encrypted data therein,

00000-09505560

wherein the sector header area includes a decipher key information area for recording therein at least one decipher key required for decrypting the encrypted data, and

wherein a size of the decipher key information area
5 is smaller than that of each decipher key.

47. The optical disk as claimed in claim 46,
wherein each decipher key is divided into a plurality of divided decipher keys having a predetermined size, and

wherein said plurality of divided decipher keys are
10 recorded in respective decipher key information areas of a plurality of continuous sectors.

48. The optical disk as claimed in claim 47,
wherein the number of the divided decipher keys is a measure of the number of the sectors which are included in
15 error correction code (ECC) blocks, and which are a plurality of sectors required for error correction.

49. The optical disk as claimed in claim 46,
wherein said respective decipher keys are recorded in a decipher key table having a plurality of decipher keys,
20 and

wherein indexes for indicating recorded positions of the decipher keys required for decrypting the encrypted data within the decipher key table are recorded in the decipher key information areas of the sectors.

25 50. The optical disk as claimed in claim 49,

wherein decipher key status areas for recording decipher key statuses on the respective decipher key areas of the decipher key table are recorded as information for representing a recorded status of the decipher key table.

5 51. The optical disk as claimed in claim 49,
 wherein the decipher key table is recorded over a plurality of different error correction code (ECC) blocks.

 52. The optical disk as claimed in claim 49,
 wherein the respective decipher keys are managed and
10 recorded in at least one unit of a file unit managed in a file management area, and an extent unit comprising a plurality of continuous sectors on the optical disk.

 53. An optical disk of recording type on which data is recordable,

15 wherein said optical disk includes a main data area for recording data therein,

 wherein said main data area includes a non-encrypted area for recording data in a non-encrypted status, and an encrypted area for recording data in an encrypted status,

20 wherein said non-encrypted area includes decipher key conversion data used for conversion of a decipher key for decrypting data, and

 wherein data in the encrypted area is encrypted using the decipher key which is converted using the decipher key
25 conversion data.

54. The optical disk as claimed in claim 53,
wherein said main data area includes a control
information recording sector for recording control information
used for controlling data reproduction in a non-encrypted
5 status, and a data recording sector for recording data in an
encrypted status;

wherein said control information recording sector
includes decipher key conversion data used for conversion of
the decipher key, and

10 wherein data in the data recording sector is
encrypted using the decipher key which is converted using the
decipher key conversion data.

55. The optical disk as claimed in claim 54,
wherein said data recording sector includes a
15 non-encrypted area for recording data in a non-encrypted status,
and an encrypted area for recording data in an encrypted status,

wherein said non-encrypted area is further decipher
key conversion data, and

20 wherein AV data in the encrypted area is encrypted
using a decipher key obtained by further converting a decipher
key, which is converted using the decipher key conversion data,
using a further second decipher key.

56. The optical disk as claimed in claim 53,
wherein said decipher key conversion data includes
25 at least copying control information of data.

reproducing data in the file unit or the extent unit
which is encrypted using the decipher key.

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updating file management information for managing data which is recorded on the optical disk, by deleting a file entry corresponding to the data to be deleted from the file management information.

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a control apparatus connected to said optical disk recording and reproducing apparatus and the data encrypting

apparatus,

wherein said optical disk recording and reproducing apparatus comprises:

first recording and reproducing means for recording
5 a decipher key table on the optical disk, and reproducing the decipher key table from the optical disk;

encrypting and decrypting means for encrypting the decipher key, transmitting the encrypted decipher key,
receiving the encrypted decipher key from the control apparatus,
10 and decrypting the encrypted decipher key; and

second recording and reproducing means for recording a decipher key status table for indicating a recorded status of the decipher key on the optical disk, and reproducing the decipher key status table from the optical disk;

15 wherein said data encrypting apparatus comprises:

encrypting means for encrypting the decipher key, and transmitting the encrypting decipher key to said control apparatus; and

wherein said control apparatus comprises:

20 receiving means for receiving the encrypted decipher key from said encrypting means of said data encrypting apparatus; and

allocating means for searching for an empty area for the decipher key based on the reproduced decipher key status
25 table, allocating the received and encrypted decipher key into

the searched empty area, and transmitting the allocated and encrypted decipher key to the optical disk recording and reproducing apparatus, and

wherein said encrypting and decrypting means of said
5 optical disk recording and reproducing apparatus receives the allocated and encrypted decipher key from said allocating means of the control apparatus, and decrypts the received encrypted decipher key.

61. An information processing system comprising:
10 an optical disk reproducing apparatus for reproducing a decipher key table comprising data and a plurality of decipher keys required for decrypting the data from an optical disk of recording type;

a control apparatus connected to said optical disk
15 reproducing apparatus; and

a data decrypting apparatus for decrypting data using the decipher keys,

wherein said optical disk reproducing apparatus comprises:

20 first reproducing means for reproducing the decipher key table from the optical disk;

encrypting means for encrypting the reproduced decipher key table, and transmitting the encrypted decipher key table to said control apparatus; and

25 second reproducing means for reproducing a decipher

key status table for indicating recorded statuses of the plurality of decipher keys from said optical disk;

wherein said control apparatus comprises:

receiving means for receiving the encrypted decipher
5 key table from said optical disk reproducing apparatus; and
searching means for searching for the encrypted
decipher key required for decrypting data which is recorded on
the optical disk from the received decipher key table, based
on the reproduced decipher key status table, and transmitting
10 the searched encrypted decipher key to the data decrypting
means; and

wherein said data decrypting apparatus comprises:

first decrypting means for decrypting the encrypted
decipher key, and producing the decipher key, and
15 second decrypting means for decrypting the encrypted
data, which is reproduced by said optical disk reproducing
apparatus, using the decrypted decipher keys.

62. An optical disk recording apparatus for
recording data on an optical disk of recording type on which
20 data is recordable,

wherein said optical disk includes a non-encrypted
area and an encrypted area, and

wherein said optical disk recording apparatus
comprises:

25 recording means for recording data, including

decipher key conversion data used for conversion of a decipher key for decrypting data, in the non-encrypted area in a non-encrypted status, and recording encrypted data in the encrypted area using the decipher key which is converted using
5 the decipher key conversion data.

63. The optical disk recording apparatus as claimed in claim 62,

wherein said optical disk includes a control information recording sector and a data recording sector, and
10 wherein said recording means records in a non-encrypted status control information used for controlling reproduction of the data in the control information recording sector, converts a cipher key into a converted decipher key using the decipher key conversion data, encrypts data using the
15 converted decipher key, and records the encrypted data in the data recording sector.

64. The optical disk recording apparatus as claimed in claim 63,

wherein said recording means records in a non-encrypted status data including further decipher key conversion data on the non-encrypted area of the data recording sector, converts the cipher key into a converted decipher key, using the decipher key conversion data included in the control information and the further decipher key conversion data,
20 encrypts data using the converted decipher key, and records the
25

encrypted data in the data recording sector.

65. An optical disk reproducing apparatus for reproducing data from an optical disk of recording type on which data is recordable,

5 wherein said optical disk includes a non-encrypted area and an encrypted area, and

 wherein said optical disk reproducing apparatus comprises:

 reproducing means for converting a decipher key into
10 a converted decipher key, using decipher key conversion data which is recorded in the non-encrypted area, decrypting data which is recorded in the encrypted area using the converted decipher key, and reproducing the decrypted data.

66. The optical disk reproducing apparatus as
15 claimed in claim 65,

 wherein said optical disk includes a control information recording sector and a data recording sector, and

 wherein said reproducing means reproduces control information used for controlling data reproduction from the
20 control information recording sector, converts a decipher key into a converted decipher key using decipher key conversion data included in the control information, decrypts data which is recorded in the data recording sector using the converted decipher key, and reproduces the decrypted data.

25 67. The optical disk reproducing apparatus as

claimed in claim 66,

wherein said reproducing means reproduces further decipher key conversion data which is recorded in the non-encrypted area of the data recording sector, converts the decipher key into a converted decipher key, using decipher key conversion data included in the control information and the reproduced further decipher key conversion data, decrypts data which is recorded in the data recording sector using the converted decipher key, and reproduces the decrypted data.

68. An optical disk recording method for recording data in an optical disk of recording type on which data is recordable,

wherein said optical disk includes a non-encrypted area and an encrypted area, and

wherein said method includes the steps of:

recording in a non-encrypted status data including decipher key conversion data used for conversion of a decipher key for decrypting data in the non-encrypted area, and recording encrypted data in the encrypted area using the decipher key which is converted using the decipher key conversion data.

69. An optical disk reproducing method for reproducing data from an optical disk in which data is recordable,

wherein said optical disk includes a non-encrypted area and an encrypted area, and

